

What is Claimed is:

1. A torch lighter, comprising:

a casing having a liquefied fuel storage and a fuel valve which is actuated by a fuel lever pivotally mounted in said casing for releasing fuel therefrom;

5 an ignition unit generating sparks directed toward an ignition chamber; and

a fuel nozzle assembly provided for vaporizing said fuel released from said fuel valve to a high-pressured gaseous fuel to emit to said ignition chamber, wherein said fuel nozzle assembly comprises:

10 a nozzle body having a root opening, an emitting opening, and at least an air inlet provided thereon, wherein said air inlet is positioned adjacent to said root opening to define an elongated mixing chamber axially extended between said air inlet to said emitting opening, wherein said mix chamber has a diameter sized between 1mm to 2.5mm and a flow of air is capable of inletting into said mixing chamber through said air inlet;

15 a torch nozzle, which is coaxially connected between said root opening of said nozzle body and said fuel valve, having a micro nozzle pore having a diameter of 0.05mm to 0.12mm and comprising a mesh filter provided below said nozzle pore for preventing residual particles of said fuel from entering said nozzle body, wherein said fuel released from said fuel valve is vaporized into a strong, pressurized gaseous fuel  
20 jetting into said mix chamber, wherein said jetting gaseous fuel and said air flowing through mix chamber are mixed to form a mixture gas at said emitting opening of said nozzle body;

a combustion housing which is supported around said emitting opening of said nozzle body and defines said ignition chamber therein; and

25 a torch head, which is provided at said emitting opening of said nozzle body and supported within said combustion housing, having:

a root chamber,

two or more elongated nozzle ducts, each having an ignition end and a root end extended and opened into said root chamber, wherein said root ends of said two nozzle ducts are adjacently positioned to define a diversion joint edge therebetween while said  
5 two ignition ends of said two nozzle ducts are diverged and extended inside said ignition chamber to define a torch gap therebetween, and

a torch stabilizing arrangement providing a plurality of root flames which are united and mixed with root portions of said torches to form a stable environment root flame for igniting said mixture gas ejected from said ignition ends of said nozzle ducts to  
10 form two or more spaced torches and stabilizing and holding said spaced torches to form a strong and stable group of said torches.

2. The torch lighter, as recited in claim 1, wherein said root chamber forms a gas stabilizing reservoir to ensure a stable flow of said mixture gas and said root ends of said nozzle ducts are extended to a ceiling of said root chamber.

15 3. The torch lighter, as recited in claim 2, wherein said nozzle body is a tubular throat conduit having a root end forming said root opening, an emitting end forming said emitting opening, wherein said air inlet is transversely formed on said root end and has a diameter slightly larger than said diameter of said mix chamber so as to provide a suction force to absorb said air into said mix chamber in such a manner that  
20 said mix chamber has a predetermined length and size arranged for said air and said gaseous fuel being evenly mixed to form said mixture gas at said emitting opening of said nozzle body.

4. The torch lighter, as recited in claim 1, wherein said combustion housing is a ring shaped body having a surrounding wall defining said ignition chamber therein  
25 and said torch head is coaxially connected to said emitting opening of said nozzle body and supported within said combustion housing in such a manner that said ignition chamber is formed surrounding said torch head.

5. The torch lighter, as recited in claim 3, wherein said combustion housing is a ring shaped body having a surrounding wall defining said ignition chamber therein  
30 and said torch head is coaxially connected to said emitting opening of said nozzle body

and supported within said combustion housing in such a manner that said ignition chamber is formed surrounding said torch head.

6. The torch lighter, as recited in claim 5, wherein a top end of said torch head is lower than a top end of said combustion housing and an outer diameter of said torch head is smaller than an inner diameter of said combustion housing, so that said ignition chamber is also formed above said torch head.

7. The torch lighter, as recited in claim 1, wherein said two adjacent root ends of said two nozzle ducts are spaced apart for 1.5mm or less such as said diversion joint edge has a size equal to 0mm to 1.5mm.

8. The torch lighter, as recited in claim 2, wherein said two adjacent root ends of said two nozzle ducts are spaced apart for 1.5mm or less such as said diversion joint edge has a size equal to 0mm to 1.5mm.

9. The torch lighter, as recited in claim 3, wherein said two adjacent root ends of said two nozzle ducts are spaced apart for 1.5mm or less such as said diversion joint edge has a size equal to 0mm to 1.5mm.

10. The torch lighter, as recited in claim 6, wherein said two adjacent root ends of said two nozzle ducts are spaced apart for 1.5mm or less such as said diversion joint edge has a size equal to 0mm to 1.5mm.

11. The torch lighter, as recited in claim 1, wherein said torch stabilizing arrangement has a plurality of diversion emitting openings formed around said torch head to communicate said root chamber with said ignition chamber, wherein diversion emitting openings are positioned adjacently below said roots ends of said nozzle ducts, thereby a main portion of said mixture gas flown into said root chamber is ejected through said two nozzle ducts and a relatively small portion of said mixture gas is diverged to emit through said diversion emitting openings and fill up said ignition chamber to be ignited to form said environment root flame surrounding said torch head and said root portions of said torches.

12. The torch lighter, as recited in claim 2, wherein said torch stabilizing arrangement has a plurality of diversion emitting openings formed around said torch head

to communicate said root chamber with said ignition chamber, wherein diversion emitting openings are positioned adjacently below said roots ends of said nozzle ducts, wherein diversion emitting openings are positioned adjacently below said roots ends of said nozzle ducts, thereby a main portion of said mixture gas flown into said root chamber is ejected through said two nozzle ducts and a relatively small portion of said mixture gas is diverged to emit through said diversion emitting openings and fill up said ignition chamber to be ignited to form said environment root flame surrounding said torch head and said root portions of said torches.

13. The torch lighter, as recited in claim 3, wherein said torch stabilizing arrangement has a plurality of diversion emitting openings formed around said torch head to communicate said root chamber with said ignition chamber, wherein diversion emitting openings are positioned adjacently below said roots ends of said nozzle ducts, wherein diversion emitting openings are positioned adjacently below said roots ends of said nozzle ducts, thereby a main portion of said mixture gas flown into said root chamber is ejected through said two nozzle ducts and a relatively small portion of said mixture gas is diverged to emit through said diversion emitting openings and fill up said ignition chamber to be ignited to form said environment root flame surrounding said torch head and said root portions of said torches.

14. The torch lighter, as recited in claim 6, wherein said torch stabilizing arrangement has a plurality of diversion emitting openings formed around said torch head to communicate said root chamber with said ignition chamber, wherein diversion emitting openings are positioned adjacently below said roots ends of said nozzle ducts, wherein a conical ceiling surface is formed extending between said root ends of said nozzle ducts and said diversion emitting openings and said diversion emitting openings are evenly spaced apart, wherein diversion emitting openings are positioned adjacently below said roots ends of said nozzle ducts, thereby a main portion of said mixture gas flown into said root chamber is ejected through said two nozzle ducts and a relatively small portion of said mixture gas is diverged to emit through said diversion emitting openings and fill up said ignition chamber to be ignited to form said environment root flame surrounding said torch head and said root portions of said torches.

15. The torch lighter, as recited in claim 9, wherein said torch stabilizing arrangement has a plurality of diversion emitting openings formed around said torch head to communicate said root chamber with said ignition chamber, wherein diversion

emitting openings are positioned adjacently below said roots ends of said nozzle ducts, thereby a main portion of said mixture gas flown into said root chamber is ejected through said two nozzle ducts and a relatively small portion of said mixture gas is diverged to emit through said diversion emitting openings and fill up said ignition chamber to be ignited to form said environment root flame surrounding said torch head and said root portions of said torches.

16. The torch lighter, as recited in claim 10, wherein said torch stabilizing arrangement has a plurality of diversion emitting openings formed around said torch head to communicate said root chamber with said ignition chamber, wherein diversion emitting openings are positioned adjacently below said roots ends of said nozzle ducts, thereby a main portion of said mixture gas flown into said root chamber is ejected through said two nozzle ducts and a relatively small portion of said mixture gas is diverged to emit through said diversion emitting openings and fill up said ignition chamber to be ignited to form said environment root flame surrounding said torch head and said root portions of said torches.

17. The torch lighter, as recited in claim 11, wherein each of said diversion emitting openings is a longitudinal slot at least evenly spacedly formed around said root chamber of said torch head.

18. The torch lighter, as recited in claim 12, wherein each of said diversion emitting openings is a longitudinal slot at least evenly spacedly formed around said root chamber of said torch head.

19. The torch lighter, as recited in claim 15, wherein each of said diversion emitting openings is a longitudinal slot at least evenly spacedly formed around said root chamber of said torch head.

20. The torch lighter, as recited in claim 16, wherein each of said diversion emitting openings is a longitudinal slot at least evenly spacedly formed around said root chamber of said torch head.

21. The torch lighter, as recited in claim 1, wherein each of said nozzle ducts is upwardly extended to have an upper portion above said torch head and said torch stabilizing arrangement has a plurality of diversion emitting openings formed at said

upper portions of said nozzle ducts, wherein said emitting end of each of said nozzle ducts is narrower and a rest of said nozzle duct such that said environment root flame is formed around a root of said respective torch for stabilizing and holding firm to said torches produced at said emitting ends of said nozzle ducts.

5           22. The torch lighter, as recited in claim 2, wherein each of said nozzle ducts is upwardly extended to have an upper portion above said torch head and said torch stabilizing arrangement has a plurality of diversion emitting openings formed at said upper portions of said nozzle ducts, wherein said emitting end of each of said nozzle ducts is narrower and a rest of said nozzle duct such that said environment root flame is  
10       formed around a root of said respective torch for stabilizing and holding firm to said torches produced at said emitting ends of said nozzle ducts.

          23. The torch lighter, as recited in claim 3, wherein each of said nozzle ducts is upwardly extended to have an upper portion above said torch head and said torch stabilizing arrangement has a plurality of diversion emitting openings formed at said  
15       upper portions of said nozzle ducts, wherein said emitting end of each of said nozzle ducts is narrower and a rest of said nozzle duct such that said environment root flame is formed around a root of said respective torch for stabilizing and holding firm to said torches produced at said emitting ends of said nozzle ducts.

          24. The torch lighter, as recited in claim 6, wherein each of said nozzle ducts  
20       is upwardly extended to have an upper portion above said torch head and said torch stabilizing arrangement has a plurality of diversion emitting openings formed at said upper portions of said nozzle ducts, wherein said emitting end of each of said nozzle ducts is narrower and a rest of said nozzle duct such that said environment root flame is formed around a root of said respective torch for stabilizing and holding firm to said  
25       torches produced at said emitting ends of said nozzle ducts.

          25. The torch lighter, as recited in claim 9, wherein each of said nozzle ducts is upwardly extended to have an upper portion above said torch head and said torch stabilizing arrangement has a plurality of diversion emitting openings formed at said upper portions of said nozzle ducts, wherein said emitting end of each of said nozzle  
30       ducts is narrower and a rest of said nozzle duct such that said environment root flame is formed around a root of said respective torch for stabilizing and holding firm to said torches produced at said emitting ends of said nozzle ducts.

26. The torch lighter, as recited in claim 10, wherein each of said nozzle ducts is upwardly extended to have an upper portion above said torch head and said torch stabilizing arrangement has a plurality of diversion emitting openings formed at said upper portions of said nozzle ducts, wherein said emitting end of each of said nozzle ducts is narrower and a rest of said nozzle duct such that said environment root flame is formed around a root of said respective torch for stabilizing and holding firm to said torches produced at said emitting ends of said nozzle ducts.

27. The torch lighter, as recited in claim 21, wherein said upper portions of said nozzle ducts are vertical extended upwardly in a parallel manner.

28. The torch lighter, as recited in claim 22, wherein said upper portions of said nozzle ducts are vertical extended upwardly in a parallel manner.

29. The torch lighter, as recited in claim 25, wherein said upper portions of said nozzle ducts are vertical extended upwardly in a parallel manner.

30. The torch lighter, as recited in claim 26, wherein said upper portions of said nozzle ducts are vertical extended upwardly in a parallel manner.

31. The torch lighter, as recited in claim 1, wherein said diameter of said nozzle pore is 0.08mm.

32. The torch lighter, as recited in claim 10, wherein said diameter of said nozzle pore is 0.08mm.

33. The torch lighter, as recited in claim 16, wherein said diameter of said nozzle pore is 0.08mm.

34. The torch lighter, as recited in claim 21, wherein said diameter of said nozzle pore is 0.08mm.